

XVIII.—*A numerical Estimate of the Species of Animals chiefly Land and Freshwater hitherto recorded from British India and its Dependencies.*—By WILLIAM T. BLANFORD, F. R. S.

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A few months ago I endeavoured to obtain an estimate of the number of species belonging to the animal kingdom that are found in British India and its Dependencies. I learned, somewhat to my surprise, that not only did no such census of the nominal species exist, but that, with the exception of the Vertebrata, the classes and orders had but rarely been catalogued in such a manner as to render an estimate of the number of species found in different countries practicable. I learned, moreover that, owing doubtless to the difficulty of ascertaining the number of species described, it was impossible to obtain a general enumeration of the fauna of any large area of the earth's surface.

The marine fauna inhabiting the seas around India is necessarily of vast extent and very imperfectly known. Confining myself, in the sub-kingdoms except the Vertebrata, to the land and freshwater fauna alone, I found anything like a correct estimate of the known species, except amongst the Vertebrata and the Mollusca, very difficult to procure. With the assistance of some friends, to whom I am greatly indebted for their aid, I have, however, obtained a rough idea of the number of species hitherto recorded in several orders, and this estimate leads to some very curious results, so much so that I think it may be useful to publish the data I have obtained, imperfect as they are.

In the first place, I should state precisely what is the area that I understand as comprised in the title of British India and its Dependencies. Of course the whole Peninsula of India proper is included, together with Ceylon. On the westward, Baluchistan is classed as a dependency, but not Afghanistan, so that the western frontier extends to Persia. Kashmir carries the boundary northward beyond the Karakoram pass to the confines of Eastern Turkestan, but this is the only Trans-Himalayan region comprised in the limits adopted; further east the small Himalayan states between Kashmir and Kamaon, with Kamaon itself, Nepal, Sikkim, and Bhutan, are all included as Dependencies, although in the case of Nepal and Bhutan the position politically is open to some question. But the fauna of these countries has always been included in that of India, and but few forms are known from them that do not occur in Sikkim or some other truly dependent state. All Great Tibet is excluded and so are the Himalayan tracts east of Bhutan. Assam with the hills to the south of the valley, Manipur, Cachar, Sylhet, Tipperah, Chutiaganj, and British Burmah

(Arakan, Pegu, Tenasserim) are comprised within our limits, but not Independent Burmah. On the mainland the frontier chosen does not run south beyond the end of Tenasserim, the Straits Settlements being excluded; but the fauna of the Andaman and Nicobar Islands is added to that of British Burma, of which they form dependencies.

It would be easy to find reasons for modifying various portions of the boundaries chosen, but they are believed to coincide as nearly as possible with the "red line" that marks the limit of British power. The most questionable addition of the whole is perhaps Ceylon, for this island, though entirely British, is in no sense a dependency of British India. But Ceylon is included for zoological reasons: its fauna differs very little indeed from that of Southern India, and the most important and typically Indian portion of the fauna would be imperfect were the animals of the island omitted.

The area thus circumscribed includes portions of two great zoological regions, the Oriental and the Palæarctic. To the latter belong northern Kashmir and part of Baluchistan together with all the Himalayas above an elevation varying from about 7000 to about 10,000 feet in different parts of the range; the former comprises the remainder of the area. The comparatively small tract of the Palæarctic region includes parts of at least two separable subregions of the higher Himalayas and portions of the Central Asiatic plateau, whilst in the Oriental part of the area the whole of two of Mr. Wallace's subregions* and portions of the other two are included.

The following are the numbers of species known, so far as I have been able to determine them. I repeat that whilst the number of Vertebrate species is, I believe, a fair approximation to the real number inhabiting the country, the Invertebrates are, as a rule, much less accurately known, and that whilst in the Vertebrata both land and marine forms are included, amongst the Invertebrata, the land and freshwater species alone are enumerated.

The data for the Mammals are various. I have collated the various works by Jerdon, Blyth, Dobson, Anderson, and others, and as nearly as I can estimate the following species are known:—

QUADRUMANA,	23
LEMURES,	3
CHIROPTERA,	80
INSECTIVORA,	55
CARNIVORA,	75

* It must be understood that Mr. Wallace's subdivisions are open to a considerable revision, and, as I shewed some years since, the boundaries of his Indian and Ceylonese subregions at all events are not correct.

CETACEA,	23
RODENTIA,	95
UNGULATA,	47
SIRENIA, ..	1
EDENTATA,	3
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	405
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For Birds, I take Mr. Hume's lists* in 'Stray Feathers,' Vol. VIII, pp. 81—116. It is scarcely necessary to say that the birds of India are better known than any other class. For the convenience of Indian ornithologists too, to whom the new classification is, as yet, not sufficiently familiar, I adopt the old as employed by Jerdon, although I must apologize for having recourse to an artificial and unscientific arrangement. I give the numbers of some of the more important orders and families. As Mr. Hume has shewn, about 70 species here included are doubtful.

RAPTORES :

<i>Accipitres</i> ,	97
<i>Striges</i> ,	52
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149

INSESSORES :

<i>Psittaci</i> ,	18
<i>Picariæ</i> ,	212
<i>Passeres</i> ,	952
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1182

COLUMBI, 46

RASORES :

<i>Pteroclidæ</i> ,	8
<i>Grallæ</i> ,	64
	<hr/>

72

1449

GRALLATORES :

<i>Otididæ</i> ,	6
<i>Limicolæ</i> ,	67
<i>Gruidæ</i> ,	4
<i>Rallidæ</i> ,	22
<i>Ciconidæ</i> , ...	6

* Mr. Hume's limits differ from mine by excluding Baluchistan and the Mergui Archipelago, which I include. There are not, however, I believe, half a dozen birds known from the two together that are not found within Indian limits elsewhere.

<i>Ardeidæ</i> ,	23
<i>Tantalidæ</i> ,	1
<i>Plataleidæ</i> ,	1
<i>Ibididæ</i> ,	5
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	135

NATATORES :

<i>Phœnicopteridæ</i> ,	2
<i>Anseres</i> ,	36
<i>Podicipidæ</i> ,	3
<i>Procellaridæ</i> ,	6
<i>Laridæ</i> ,	34
<i>Phaëtonidæ</i> ,	3
<i>Sulidæ</i> ,	3
<i>Attagenidæ</i> ,	2
<i>Pelacanidæ</i> ,	4
<i>Graculidæ</i> ,	4
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	97
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	1681
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The data for the Reptiles are again various. Gunther's and Theobald's works form the basis for the enumeration.

CHELONIA,	54
CROCODILIA,	4

LACERTILIA :

<i>Varanidæ</i> , ..	5
<i>Lacertidæ</i> , ..	14
<i>Zonuridæ</i> , ..	1
<i>Scincidæ</i> , ..	48
<i>Geckotidæ</i> , ..	59
<i>Agamidæ</i> , ..	54
<i>Chamæleontidæ</i> , ..	1
	<hr/>
	182

OPHIDIA :

<i>Typhlopidae</i> ,	10
<i>Tortricidæ</i> ,	2
<i>Xenopeltidæ</i> ,	1
<i>Uropeltidæ</i> ,	41
<i>Calamaridæ</i> ,	11
<i>Oligodontidæ</i> ,	27
<i>Colubridæ</i> ,	57
<i>Homalopsidæ</i> ,	10

OPHIDIA :

<i>Acontiophidæ</i> ,	1
<i>Psammophidæ</i> ,	3
<i>Dendrophidæ</i> ,	5
<i>Dryiophidæ</i> ,	8
<i>Dipsadidæ</i> ,	12
<i>Lycodontidæ</i> ,.....	10
<i>Amblycephalidæ</i> ,	5
<i>Pythonidæ</i> ,	2
<i>Erycidæ</i> ,	2
<i>Acrochordidæ</i> ,	1
<i>Elapidæ</i> ,	15
<i>Hybridæ</i> ,	30
<i>Crotalidæ</i> ,.....	17
<i>Viperidæ</i> ,	4
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	274
	<hr/>
	514

The number of Amphibia is less easily determined as the species of BATRACHIA require careful revision. The number known is about 100, of which 1 only belongs to the URODELA and 5 to the PSEUDOPHIDIA.

The numbers of the Fishes are taken from Dr. Day's work, and are consequently trustworthy.

<i>Acanthopterygii</i> ,.....	705
<i>Acanthini</i> ,	43
<i>Physostomi</i> ,	485
<i>Lophobranchii</i> ,	15
<i>Plectognathi</i> ,	44
<i>Chondropterygii</i> ,.....	65
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	1357
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My principal authority for the Mollusca (land and freshwater) is Mr. Theobald's list printed as a supplement to the *Conchologia Indica*. I have omitted the estuarine species therein enumerated. Unfortunately I have not the numbers of the different families, and, as I am writing away from books, I can only give the approximate numbers of the classes here. They are—

GASTEROPODA (land and freshwater),	900
LAMELLIBRANCHIATA (all freshwater),	100
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	1000
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The next subkingdom Arthropoda includes the most formidable numerically of all orders, those of insects. Of some of these fairly approximate estimates may be formed, the principal difficulty in groups like Coleoptera and Lepidoptera being the labour of enumeration, but of many orders very little is known.

The numbers of the COLEOPTERA are taken from Gemminger and Harold's Catalogue, with additions up to 1878 from the Zoological Record. The following is the result :

<i>Cicindelidæ</i> ,	112
<i>Carabidæ</i> ,	617
<i>Dytiscidæ</i> ,	44
<i>Gyrinidæ</i> ,	13
<i>Hydrophilidæ</i> ,	30
<i>Paussidæ</i> ,	33
<i>Staphylinidæ</i> ,	476
<i>Pselaphidæ</i> ,	76
<i>Scydmenidæ</i> ,	40
<i>Silphidæ</i> ,	11
<i>Trichopterygidæ</i> ,	12
<i>Scaphidiidæ</i> ,	7
<i>Histeridæ</i> ,	79
<i>Phalacridæ</i> ,	18
<i>Nitidulidæ</i> ,	63
<i>Trogositidæ</i> ,	9
<i>Colydiidæ</i> ,	19
<i>Rhysodidæ</i> ,	3
<i>Cucujidæ</i> ,	27
<i>Cryptophagidæ</i> ,	9
<i>Lathridiidæ</i> ,	19
<i>Mycetophagidæ</i> ,	3
<i>Dermestidæ</i> ,	8
<i>Byrrhidæ</i> ,	12
<i>Parnidæ</i> ,	5
<i>Heteroceridæ</i> ,	6
<i>Lucanidæ</i> ,	96
<i>Scarabæidæ</i> ,	558
<i>Buprestidæ</i> ,	107
<i>Throscidæ</i> ,	4
<i>Eucnemidæ</i> ,	19
<i>Elateridæ</i> ,	285
<i>Rhipidoceridæ</i> ,	7
<i>Dascillidæ</i> ,	17
<i>Telephoridæ</i> ,	96

<i>Oleridae</i> ,	48
<i>Lymexylidae</i> ,	2
<i>Ptinidae</i> ,	4
<i>Bostrychidae</i> ,	2
<i>Cioidae</i> ,	6
<i>Trictenotomidae</i> ,	2
<i>Tenebrionidae</i> ,	148
<i>Melandryidae</i> ,	2
<i>Lagriidae</i> ,	5
<i>Peditidae</i> ,	12
<i>Anthicidae</i> ,	65
<i>Mordellidae</i> ,	5
<i>Rhipidophoridae</i> ,	6
<i>Cantharidae</i> ,	37
<i>Edemeridae</i> ,	2
<i>Curculionidae</i> ,	248
<i>Scolytidae</i> ,	59
<i>Brenthidae</i> ,	18
<i>Anthribidae</i> ,	35
<i>Bruchidae</i> ,	28
<i>Cerambycidae</i> ,	341
<i>Chrysomelidae</i> ,	526
<i>Languridae</i> ,	18
<i>Erotylidae</i> ,	39
<i>Endomychidae</i> ,	29
<i>Coccinellidae</i> ,	145
<i>Corylophidae</i> ,	8
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	4780

Of the HYMENOPTERA I find 393 in the British Museum Catalogues, in which, however, some of the largest families such as *Ichneumonidae* are wanting. In the Zoological Record 277 additional species are noticed. Probably about 150 to 200 other forms are known and the number of described species may be estimated at 850.

I am indebted to Mr. F. Moore, who has probably a more extensive knowledge of Indian Lepidoptera, and especially of the moths, than any other naturalist, for an estimate of the number of described species of HETEROCERA. The following is the result :

<i>Sphinges</i> ,	225
<i>Bombyces</i> ,	1150
<i>Noctues</i> ,	1150

<i>Pyrales,</i>	330
<i>Geometres,</i>	600
<i>Crambices,</i>	130
<i>Tortrices and Tineines,</i>	160
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	3745
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The RHOPALOCERA, or butterflies, have been enumerated for me by Mr. W. L. Distant, to whom I am indebted for assistance in several matters connected with this enquiry. He considers the number of species known to be about 875. The whole number of LEPIDOPTERA is consequently 4,620.

I am also indebted to Mr. Distant for having taken the trouble of approximately estimating the known RHYNCHOTA. He finds the number to be about

HEMIPTERA HETEROPTERA,	450
HEMIPTERA HOMOPTERA,	200
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	650
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Mr. R. McLachlan, to whom I applied for assistance in the order of NEUROPTERA of which he has made a special study, considers that 350 is a fair estimate.

I have been unable to obtain any trustworthy enumeration of the DIPTERA and ORTHOPTERA.

Amongst the other classes of the Arthropoda the only trustworthy information I have been able to procure is from Mr. Cambridge who informs me that although a large number of Indian Spiders have been collected very few have been determined or described. He knows of only 108 species distributed amongst the following families :

<i>Theraphosidae,</i>	3
<i>Tetrablemmidae,</i>	1
<i>Drassidae,</i>	12
<i>Palpimanidae,</i>	1
<i>Agelenidae,</i>	2
<i>Hersiliidae,</i>	2
<i>Scytodidae,</i>	2
<i>Pholeidae,</i>	4
<i>Theridiidae,</i>	10
<i>Phoroncididae,</i>	5
<i>Epeiridae,</i>	16
<i>Gasteracanthidae,</i>	11

<i>Uloboridae</i> ,	1
<i>Magammopidae</i> ,	2
<i>Polbidae</i> ,	1
<i>Stephanopidae</i> ,	1
<i>Thomisidae</i> ,	12
<i>Lycosidae</i> ,	5
<i>Oxyopidae</i> ,	5
<i>Salticidae</i> ,	12
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	108

To these may be added about a dozen scorpions making 120 ARACHNIDA.

The MYRIOPODA may be estimated roughly at 50.

The CRUSTACEA land and freshwater can scarcely exceed 100.

Of Vermes I can only find some 14 described species, 7 Planarians, 5 earthworms, and 2 leeches. I am indebted to Professor Jeffrey Bell for these numbers.

The following is a summary of the enumeration given above.

	Number of species.
VERTEBRATA.	
Mammals,	405
Birds,	1681
Reptiles,	514
Amphibia,	100
Fishes,	1357
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	4058
MOLLUSCA (LAND AND FRESHWATER ONLY).	
Gasteropoda,	900
Lamellibranchiata,	100
	<hr/>
	1000
ARTHROPODA.	
INSECTA.	
Coleoptera,	4780
Hymenoptera,	850
Lepidoptera,	4620
Diptera,	500 ?
Rhynchota,	650
Neuroptera,	350
Orthoptera,	350 ?
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	12,100

MYRIOPODA,	50 ?	
ARACHNIDA,	120	
CRUSTACEA,	100 ?	
	—	270
		<hr/>
		12,370

VERMES.

Only about 14 species appear to be recorded.

I repeat that the numbers given for the *Arthropoda* are in some cases little more than guesses. I have not had time to go through some lists, an examination of which would have enabled me to give more accurate estimates. But except in the case of the four numbers to which a note of interrogation is appended the figures given are I believe a fair approximation to the truth, and the result is one that I think should make Anglo-Indian naturalists endeavour to improve our knowledge of the fauna. It is scarcely creditable that in a perfectly accessible country, with facilities for travelling and for living in different parts of the area unrivalled within the tropics, we should remain so ignorant of the zoology. It is ridiculous to suppose that the Indian *Coleoptera* are scarcely more numerous than the *Lepidoptera*, that the *Hymenoptera* (which very probably rival and may excel, each of the other orders) are only between $\frac{1}{5}$ and $\frac{1}{8}$ as numerous, or that the *Neuroptera*, of which, Mr. McLachlan tells me, about 1000 are known from Europe are only represented by 350 species. As to the spiders, it is no exaggeration to say that in most parts of India 108 species might be collected in a few days' search. It is to be hoped that the next five years will witness a very considerable increase in our knowledge of the fauna of India.

XIX.—*Description of a new Species of the Lepidopterous Genus Euripus from North-Eastern India.*—By J. WOOD-MASON, Deputy Superintendent, Indian Museum, Calcutta.

EURIPUS CINNAMOMEUS, n. sp., Pl. IV, Fig. 4.

♀. Anterior wings above purplish black-brown darkest at the base and along the edges and glossed with steel-blue on the disk, with a conspicuous suboval or subtriangular patch of changeable lilac-blue divided by the dark veins, commencing broadly just in front of the ultimate subcostal fork and rapidly narrowing to the inner angle, and with an indistinct submarginal series of small roundish white spots placed upon the inner edge of the narrow black-brown outer border and extending from the inner angle up to the third median veinlet.

Posterior wings above black-brown of a richer tint, broadly and interdigitatingly bordered externally with clear cinnamon-brown, which is traversed by the dark brown veins and bears, midway between the black base and the wavy purplish-black narrow outer border of the organs, a series of four impressed white specks all encircled internally with black-brown, one in each interspace from the first median to the second subcostal veinlet, and, at its junction with the wavy black outer border, a similar but more complete series of white specks, two to each interspace (except the second, in which there are four, the middle one of the three being divided) from the internal vein to the first subcostal veinlet, and all roundish, except the first two, which present the form of linear marks parallel to the outer margin.

Wings below cinnamon-brown all narrowly bordered externally with purplish black-brown, with the veins rich dark brown and the submarginal spots more numerous and distinct than above.

Anterior pair slightly darker for their basal two-thirds, with a short streak of pale lilac between the first and second median veinlets near the base of the cell and an ill-defined roundish clump of scales of the same colour beyond it, an externally forked streak of dark violet-blue occupying the basal two-thirds of the internommedian area and followed by a indistinct clump of violet-grey scales, a grey streak in the apical half of the sutural area, and a submarginal series of violet-white spots situated upon the inner edge of the black outer border, and extending from the sutural area to the apical angle, with all the spots round except the first six (which have the form of linear streaks) and the last (which is elongate), and arranged two in each interspace except the eighth from the apex (in which there are three) and the last, in which there is only one.

Posterior pair uniformly coloured, with a discal series of seven violet-white spots and dots, arranged in two series, an anterior curved one of three, and a posterior straight one of four, the three foremost of which latter, with the last of the anterior series, coincide with the four impressed spots of the upperside; and with a submarginal series of spots of the same colour, situation, and extent as in the anterior wings, but differing somewhat in shape, the last three being linear streaks parallel to the outer margin and the rest more or less elongate and those of each pair divergent externally as if they were the remaining outer ends or horns of lost lunules.

Length of anterior wing 1·6; whence expanse = 3·34 inches.

HAB. Shillong, Khasi Hills, N. E. India. A single specimen of this beautiful and distinct species has been communicated to by Mr. L. De Nicéville. It was captured in November last by the late Mr. J. P. Cock.
